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40-Minute Lesson Plan Based on

AUSTRIA

Theme Article, pages 8 and 9

Aims

1. To show how the economic problems created by World War I weakened Austria between the two World Wars and still persist as the basis of her problems today.

2. To show the events leading up to Hitler's annexation of Austria.

3. To show that Austria will have the opportunity to develop as a free and democratic nation.

Pivotal Questions

1. What were some of the differences in Austria's position before and after World War I?

Before the war, Austria was a nation of 261,000 square miles and more than 51,000,000 in population. By the Treaty of Saint Germain, her territory was reduced to 32,000 square miles and her population to 6,000,000. Before the war, Austria was an empire ruled by the Hapsburgs, and senior partner in the Austria-Hungary dual monarchy. After World War I, Hungary became an independent nation and Austria a republic. Before World War I, Austria was a first-rate power; after the war, Austria was one of the lesser nations. A multinational state composed of Germans, Magyars, Czechs before the war, Austria was left with a strong German element when the minority groups became autonomous. As shown in last week's theme article, Austria-Hungary was a well-integrated economic unit. After the war, neither Hungary nor Austria was economically sound.

2. Why couldn't Austrian farmers grow enough food to feed the Austrian people?

After World War I, Austria was deprived of much land. Austria became a plot of land around the nucleus of industrial Vienna. Only one-third of the population was engaged in agriculture. Southern Austria is mountainous and unfit for agriculture.

3. Why was Dolfuss able to make himself dictator in 1933?

Bad economic conditions gave rise to a feeling that a strong leader might lead the country out of its economic chaos. Austria was hard hit by the world economic collapse of the early thirties. The pattern of dictatorship set by other European dictators was easy to follow. Dolfuss played upon the differences between the workers and peasants. Collaboration with Mussolini gave him strength at home.

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COMING NEXT ISSUE

Theme Article: Czechoslovakia
Science and Invention: The Cyclotron
Builders of America: John Adams

4. What would you say were Austria's greatest errors in the 1930s, when she was attempting to remain independent?

Some of these might be: (1) Tacit acceptance of Dolfuss as dictator; (2) Cooperation of Dolfuss with Mussolini; (3) Continued feeling on the part of the Austrians that you could do business with Hitler; (4) Acceptance of Nazi control without even a token resistance to inform the rest of the world that the Austrian Nazis did not truly represent Austria's feelings in the matter. However, pupils must understand that there were many factors leading to Austria's downfall over which Austria had no control. Austria's economic dependency on other nations; the fact that Austria is a small, central European nation bound to be caught in a web of power politics; the fact that Austria was first in line in Germany's movement to the east.

5. What attitude have the Allies taken towards Austria now that the war is over? Do you think the Allies are right?

The Allies have occupied Austria as a defeated enemy nation. They have been lenient, however, since they consider Austria less guilty than Germany. Though occupied by U. S., British, French, and Russian troops, Austria has held a free, democratic election and is now being ruled by a government of her own choosing.

6. How would you suggest that Austria rebuild herself politically and economically, so that she may be an independent nation?

END OF 40-MINUTE LESSON PLAN

Classroom and Magazine Working Together

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QUICK QUIZ

1. Who is Prime Minister of Austria? (Leopold Figl.)
2. Was Austria a republic or an empire between the two World Wars? (Republic.)
3. To what political party did the majority of Austrian workers belong after World War I? (Socialist Party.)
4. What Austrian Prime Minister made a deal with Hitler in 1936? (Dr. Kurt von Schuschnigg.)
5. Where did the Wright brothers make the first successful power-plane flight? (Kitty Hawk, N. C.)
6. What American discovered a process for "air-boiling" iron into steel? (William Kelly.)
7. Who is President of the Philippine Commonwealth? (Sergio Osmena.)
8. What two countries will share ownership of the proposed Great Lakes-St. Lawrence Seaway? (United States and Canada.)
9. Who was the first scientist to smash the atom? (Sir Ernest Rutherford.)
10. Who was President when the U.S. took the Phillipines? (William McKinley.)

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AIR TRANSPORTATION — pp. 4, 5

This week, we present the second in our series of three articles on transportation. The third article will appear in the issue of April 29.

Commerce Takes to the Air describes the airlines' problems and plans for girdling the globe with a network of airlanes. The article is closely linked with the first power plane flight, made by the Wright brothers, as dramatized in *Up from Kitty Hawk* (pp. 10, 11, 12).

Have pupils read the play as an introduction to the article on today's aircraft.

Two of the objectives of the unit on transportation are: (1) To learn why transportation is necessary in a complex society; (2) To discover how transportation has brought nations closer together.

Do pupils regard the huge new passenger and cargo planes as a natural development of present-day society? Why?

Special Activity

Have pupils show how the airplane has brought the world closer together by (a) charting air routes and railroad lines in the U. S. and comparing their travel time between key cities; (b) tracing air routes and shipping lanes between key global points and comparing their travel time.

Discussion Questions

1. Can you think of any disadvantages in transporting certain kinds of freight by plane? By train? By ship (both inland water and trans-ocean vessels)?
2. Compare the differences between air travel in 1903 and today.

Fact Questions

1. Name three U. S. airlines that carry passengers to foreign lands.
2. What city is building the largest airport in the United States?

THE PHILIPPINES — p. 3

Discussion Questions

1. Do you think U. S. control has hindered or helped the people of the Philippines?
2. If you had been a member of Congress in 1934, would you have voted for Philippine independence?
3. Should the U. S. continue to give special advantages to the Philippines after they are independent?
4. What effect do you think Philippine independence will have on other colonies seeking independence?

Fact Questions

1. How did the U. S. get possession of the Philippines? From what nation?
2. On what date will the Filipinos become independent?
3. What nation occupied the Philippines from 1941 to 1945? What effects of this occupation would you find if you visited the Philippines today?
4. Who are the candidates for President of the Philippines? When will the election be held?

ST. LAWRENCE SEAWAY — pp. 6, 7

On a map of North America, have pupils trace the natural coastline of the United States. Then have them trace our "fourth seacoast" in the event the Great Lakes-St. Lawrence Seaway is completed.

What U. S. and Canadian cities would benefit from the completed seaway? In what ways would they benefit?

Discussion Questions

1. Are you in favor of the Great Lakes-St. Lawrence Seaway? Why, or why not?
2. How many peacetime benefits can you think of that would result from the completed seaway? How many wartime benefits?

Fact Questions

1. What nation will pay most of the costs if the seaway is completed? Why?
2. What state will pay the largest U. S. share of the costs? Why?
3. Name the five Great Lakes that would be linked by the seaway.

The feature "Today the Classroom — Tomorrow the World" is omitted from this issue. It will be resumed next week.

Answers to Citizenship Quiz, p. 16

1. QUIZ IN THREE-QUARTER TIME: 1-a; 2-c; 3-b; 4-a; 5-a; 6-b; 7-b; 8-c.
2. TWO IN A MATCH: a-2; b-4; c-5; d-1; e-3.
3. FILL IN: 1-Spain; 2-Great Lakes-St. Lawrence Seaway; 3-Sir Ernest Rutherford; 4-steel; 5-Canada.
4. PICTURES TO GUIDE YOU: 1-Kitty Hawk, N. C.; 2-St. Lawrence; 3-(1) Superior; (2) Michigan; (3) Huron; (4) Erie; (5) Ontario; 4-Sergio Osmena; 5-New York; 6-Vienna.

Solution to News Word Puzzle, p. 18

ACROSS: 1-oar; 4-Salzburg; 9-out; 10-agar; 11-us; 12-St.; 13-ma; 14-Tyrol; 17-Taos; 21-pro; 22-R. I.; 23-zero; 24-Aino; 26-M. P.; 28-rip; 29-lads; 30-aloof; 32-A. M.; 34-an; 35-if; 37-keen; 39-ice; 40-attended; 42-add.

DOWN: 1-oz.; 2-abator; 3-rug; 4-sou; 5-Austria; 6-Lt.; 7-ram; 8-Gratz; 12-sr.; 15-yond; 16-Lima; 18-aero; 19-orifice; 20-sop; 21-pal; 25-Osaka; 27-planed; 31-on; 33-met; 36-fed; 38-eta; 39-I'D; 41-N. D.

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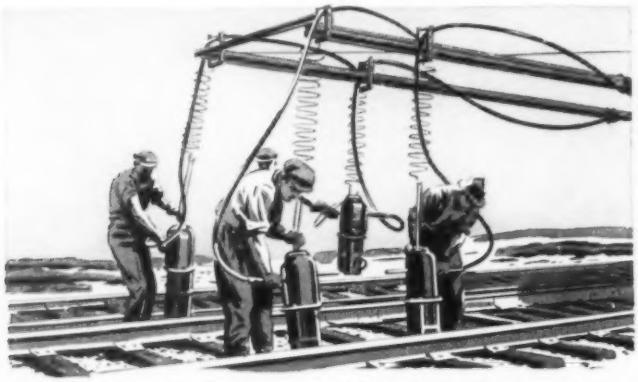
TRANSPORTATION ISSUE

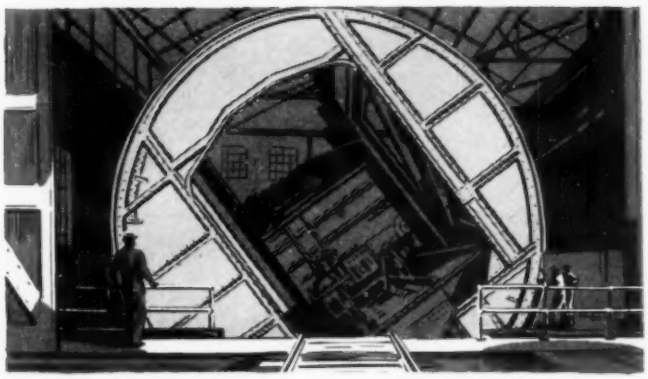
The Train that Keeps a Diary!

AN INGENIOUS "LABORATORY ON WHEELS"—TYPICAL OF THE FAR-REACHING, BEHIND-THE-SCENES RESEARCH THAT KEEPS AMERICA'S RAILROADS OUT IN FRONT.

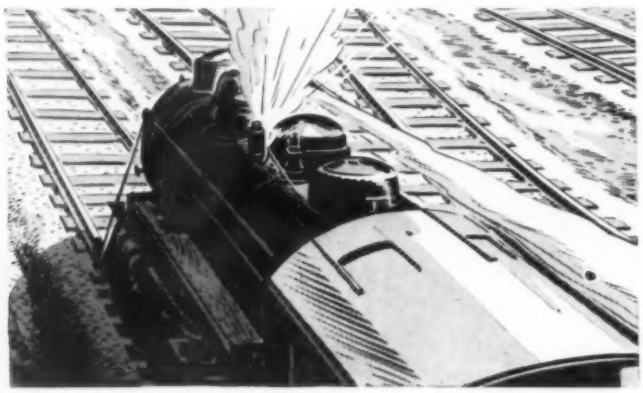
THIS IS THE INSIDE OF A DYNAMOMETER CAR—SYMBOLIC OF THE INTENSIVE AND CONTINUOUS RESEARCH OF THE NATION'S RAILROADS. AS THE TEST TRAIN ROLLS ALONG, THE INSTRUMENTS IN THIS INGENIOUS "LABORATORY ON WHEELS" GATHER AND RECORD AUTOMATICALLY ALL SORTS OF TECHNICAL DATA ON THE PULL AND POWER OF THE LOCOMOTIVE, THE PERFORMANCE OF AIR BRAKES AND THE ACTION OF THE TRAIN.



RESEARCH SMOOTHS THE WAY FOR MORE COMFORTABLE TRAVEL. EACH "LEG," OR METAL SPRING OF THIS "FOUR-LEGGED HAMMER," DEVELOPED BY RAILROAD RESEARCH, DRIVES A PNEUMATIC TAMPING MACHINE FOR PACKING BALLAST ON ROADBEDS, TO GIVE YOU A SMOOTHER, MORE COMFORTABLE RIDE.



RESEARCH FINDS A WAY TO UNLOAD 80 TONS OF FREIGHT A MINUTE. AN OPEN FREIGHT CAR OF COAL IS BACKED INTO THIS DUMPER, TURNED "BOTTOMS UP," AND UNLOADED AT THE RATE OF 80 TONS A MINUTE. IN ANOTHER DEVICE JUST AS REMARKABLE, A CAR OF GRAIN IS TIPPED AND TILTED, THIS WAY AND THAT, UNTIL EMPTIED OF ITS CONTENTS.



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AND HERE'S A RAILROAD FACT FOR THE YOUNG IN HEART: MOST YOUNGSTERS, AND LOTS OF FOLKS YOUNG IN HEART, HAVE WONDERED WHAT IT COSTS TO BLOW A LOCOMOTIVE WHISTLE. THE COST VARIES, OF COURSE, BUT ONE RAILROAD FINDS THAT THE AVERAGE TOOT COSTS ABOUT 1/3 OF A CENT.

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Independence for the Philippines

NEXT July 4th will be Independence Day not only for the United States, but also for the Philippine Islands.

On July 4, 1946, the people of the Philippines will end their 400-year struggle for independence.

For most of that time, the Philippines were under Spanish rule. But in 1898, in the Spanish-American War, we took the Philippines from Spain. For the Philippine Islands, Puerto Rico, and Guam, the U. S. paid Spain a total of $20,000,000.

In 1899, President William McKinley announced our Government's policy toward the Philippines. He said, "The Philippines are ours, not to exploit* but to develop; to civilize, to educate, to train in the science of self-government."

The United States has lived up to this pledge. Our Government has built schools, roads, and hospitals in the Philippines. Under U. S. control, the Philippines have become the healthiest islands in the Pacific.

Our Government has encouraged Filipino trade by allowing their goods to enter the U. S. tariff-free. Before the war, more than 80 per cent of Philippine exports were shipped to the U. S. These products included sugar, Manila hemp (rope fiber), coconut oil, and tobacco.

In 1934 our Government decided that the Philippines were ready for a large measure of self-government, and Congress passed the Tydings-McDuffie Act. This act permitted the Filipinos to set up their own Commonwealth in 1935. It also stated that on July 4, 1946, the Philippine Islands would become completely independent.

The Filipinos need help in rebuilding their war-torn country before they can take advantage of their independence.

From 50 to 80 per cent of all Philippine cities have been "bombed out," and almost all public buildings, schools, and factories have been badly damaged or destroyed.

During the Japanese occupation, the Philippines were looted of farm tools, machinery, and raw materials. As a result, the Filipinos' food supply is very low. The health of most Filipinos is poor, because they are underfed and lack sufficient clothing and shelter.

U. S. TO HELP

In granting the Filipinos their independence, the United States does not intend to abandon them when they need help so desperately. Now before Congress are several bills designed to aid the Philippines.

A bill submitted to Congress by C. Jasper Bell, representative from Missouri, states that we shall continue free trade with the Philippines for eight years after they are granted independence. Then we will charge the Philippines 4 per cent of the tariff we charge other nations who export goods to the U. S.

This tariff would be increased 4 per cent more each year, until – after 25 years – the Filipinos would be paying the regular tariff rate.

Another bill, introduced by Senator Millard E. Tydings, of Maryland, calls for a $480,000,000 payment to the Philippines. This money will be used for reconstruction – to build public works and repair bomb damages.

The U. S. will also protect the Philippines in other ways. New American military bases will be built on the islands, to protect the Philippines from invasion. Building these bases will provide work for thousands of Filipinos.

Next month, the Filipinos will hold an election, in which they will choose the first President of the Philippines.

The principal candidates are Sergio Osmena, now President of the Philippine Commonwealth; and Manuel Roxas, who helped General MacArthur to escape from Corregidor, but later held public office under the Japanese.

* Means word is defined on p. 16.

Harris & Ewing

Jubilant Filipinos welcome first U. S. soldier to land on Luzon when the island was liberated from the Japanese.

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COMMERCE takes to the

Pan-American Airways

Passengers board a Douglas Skymaster for points east

FLASH! World's first air-freight flight. Sixty pounds of blue necktie silk flown from Dayton to Columbus, Ohio. Time: 1 hour, 6 minutes. Year: 1910.

Stand on an airfield near San Francisco, Calif., today, and that 1910 record seems as old-fashioned as the Stone Age.

A truck drives onto the field and backs up under the tail of a waiting "Packet" – a Fairchild C-82 cargo plane. A ramp in the rear hold of the plane lowers until it is level with the open back door of the truck. Two men begin shoving packages quickly along the ramp from truck to plane.

The packages contain gardenias, freshly picked at nearby gardens. Inside the plane, the flowers are placed in fiberglas cloth containers – zippered up on one side and topped with dry ice.

Soon, another van rolls up to the packed ramp and unloads crates of grapes, strawberries, avocado pears, and vegetables fresh from the orchards and truck farms of San Joaquin Valley. This food is piled into a specially-cooled, thermostat-controlled compartment of the plane.

Next, crates of machine tools are taken aboard. And finally, an autogiro arrives with some snake vaccine to be shipped.

The ramp is closed, the propeller spins, and the big transport is off. In six hours, it will unload the vaccine and machine tools at Salt Lake City. Ten hours later, it will deliver the remainder of its load in Chicago.

By nightfall, a Chicago housewife will be serving a meal with fresh California artichokes. And some lucky Chicago girl will go to a dance with a giant California gardenia pinned to her evening wrap.

The main advantage air freight has over land and sea transportation is that it does away with train-to-ship-to-train transfers of many goods. For example: rubber from Brazil can be flown directly to processing plants in Akron, Ohio. Using surface transportation, the rubber would first have to go by train to the seacoast of Brazil, then by ship to the United States, and finally by train to Akron.

With many cargoes, the high speed of the airplane – eight to ten times as fast as land and sea transportation – is another advantage. Cargoes which especially benefit from air transport include perishable vegetables and fruits, flowers, emergency medicines and machine tools, and newspapers and magazines, which have time value.

But there is a big cloud on the air-cargo horizon – the high cost of air transport.

The railroads make their big money not on passengers, but on freight – for which they charge an average of two cents a ton per mile.

The airlines make their profit on passengers, rather than on freight. The lowest rate the airlines have been able to charge for freight is about fifteen cents a ton per mile. The airlines hope to reduce this rate and handle much more freight than they have been carrying.

The airlines also expect to handle about 40 per cent of all express cargo now being shipped by rail. In time, all first-class mail going a distance of 400 miles will be sent by air. So will 80 per cent of all parcel post.

TWENTY MILLION PASSENGERS

Twenty million passengers a year – that's the airlines' goal. Cargo transportation amounts to only three per cent of the airlines' yearly mileage. Mail amounts to eight per cent. By far the bulk of the airlines' business is the transportation of passengers.

Last year, the airlines carried more than five million passengers. Within ten years, they hope to carry four times that number on domestic trips alone.

What will the new planes be like? They will be speedy, swanky, and comfortable. TWA's 55-passenger *Constellation* should make the cross-country hop in ten hours. Republic's *Rainbow* will speed 46 passengers from New York to Los Angeles at 400 miles per hour. Pan-American's giant *Consolidated Vultee 37* will zip 204 passengers to Europe in about nine hours.

America Has Taken the Lead in Weaving Global Air-Nets Around the World

AIR

The giant planes will take off from immense airports in San Francisco, Seattle, and Los Angeles for the Far East. Miami, Florida, and Houston, Texas, are leading terminals for planes bound for Latin America. New York City and Boston are key terminals for trans-Atlantic flights to Europe.

Many of these cities have plans for bigger and better airports. New York City is now constructing the largest airport in the country – the 4,572-acre Idlewild Airport.

When completed, Idlewild will be able to handle 180 plane take-offs and 180 landings every hour. About 30,000 passengers are expected to use the Idlewild Airport daily. Fifteen nations have already applied for airline operating space at Idlewild.

AIR TRAVEL IS CHEAP

By 1955, according to the CAA, there will be about 1,200 passenger planes in the United States. About 430 of these will be used for overseas flights. They are expected to carry two million passengers a year to and from foreign shores.

What will it cost? For almost every long-distance United States run, an airline ticket costs less than a first-class railroad fare with a lower Pullman berth.

A trip from Boston to Washington costs about $18.40 by air, $20.21 by rail. A trip from Charleston to Detroit costs $35.80 by air, $40.74 by rail.

Overseas air rates are still higher than first-class ship fares, but they are dropping constantly. Before the war, a trip from New York to London cost about $375 by air, $200 by ship. The airlines would like to cut one-way trans-Atlantic fares to $120. Their goal is a trans-Atlantic round-trip for $200 – and for "globe-girdlers," a round-the-world flight for $750.

The reason U. S. airlines have not reduced their rates is that other countries have objected. Britain, for example, cannot afford to charge less than $647 for the trans-Atlantic hop.

When Pan-American recently cut its New York-to-London fare to $275, the British protested. Britain refused to let Pan-American run more than two flights a week until the airline "upped" its price to $375. However, an agreement may soon be worked out with foreign countries that will permit reduced rates.

Where can you fly? Anywhere in the world, the airlines hope – but not just yet.

At present, U. S. airlines are sparring with each other, and with foreign airlines, for rights to new air routes which will cover the globe like a giant network.

The biggest of all airlines flying the international air is Pan-American, which connects the United States to 56 countries on five continents. For years, Pan-American was the only U. S. overseas airline, but today there are two others.

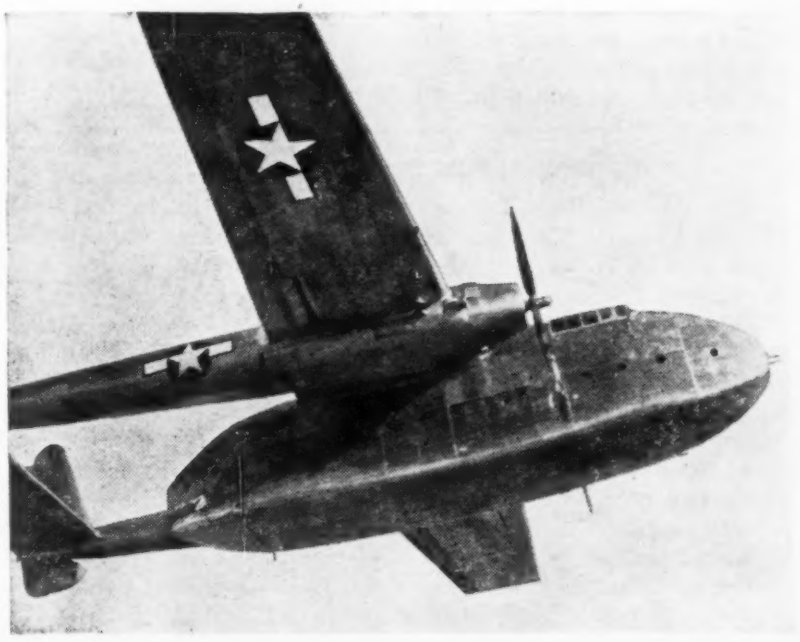
APPROVE OVERSEAS ROUTES

So far, the C.A.B. has approved overseas routes for three U. S. airlines. These are T.W.A., Pan-American, and American Overseas Airlines. A fourth company, Northwestern Airlines, may soon be awarded a route to the Orient.

Except for Russia most countries now agree that the air routes should be open to all nations. Russia refuses to let foreign planes fly over her territory.

Britain and the United States started the ball rolling in this direction last month by signing an air treaty in Bermuda. The treaty states that the planes of both nations will be allowed to land in each other's country to pick up or unload passengers.

The United States will allow the commercial planes of all nations to use the bases we have built in Bermuda, the West Indies, Canada, and Newfoundland. By the terms of this treaty, British and American statesmen have shown that they recognize an historic fact; that the air ocean which surrounds our planet belongs equally to all countries. The nations of the world must enjoy freedom of the air as they now enjoy freedom of the seas.



Fairchild Aviation

Fairchild Packet is often called "The Flying Boxcar."

GREAT LAKES–ST. LAWRENCE SEAWAY

A "Fourth Seacoast" for the United States?

CONGRESS may soon change the geography of the United States by giving us a "fourth seacoast."

The United States has three seacoasts – the Atlantic, the Gulf of Mexico, and the Pacific.

The "fourth seacoast" would be formed by the five Great Lakes and the St. Lawrence River. Inland cities – like Duluth, Milwaukee, Chicago, Detroit, and Cleveland – would be transformed into "seaports."

A plan to carry out this dramatic idea is now before Congress. It is known as the "St. Lawrence Seaway and Hydroelectric Power Project."

The project has two aims.

DEEPEN RIVER

1. To deepen the shallow parts of the St. Lawrence River and build new locks and canals. This will permit big ocean-going ships to sail from the Atlantic through the St. Lawrence River and into the Great Lakes.

At present, only small ships can make the trip, because in some places the St. Lawrence is too shallow for ocean-going vessels. New canals and locks are also needed. When these improvements are made, a 2,500-mile water highway, from the Atlantic to the heart of the continent, will be open for deep-sea ships.

BUILD POWER PLANT

2. To build a huge hydroelectric plant at Massena, N. Y. (see map) – the largest hydroelectric plant in the world.

This huge dam would harness the swift waters of the International Rapids – a 48-mile stretch of the St. Lawrence between Lake Ontario and Montreal, Canada. It would generate 1,614,200 kilowatts of electricity, the equivalent of 2,200,000 horsepower – to be equally divided between the U. S. and Canada.

The new dam would supply low-cost electric power to people within a 300-mile radius, including New York State and portions of Pennsylvania, New Jersey, Massachusetts, and Vermont. Those who favor the hydroelectric project say it would save the people of New York State about $153,000,000 a year. Vermont's power and light bill would be cut in half, they say, with a saving of $3,000,000 a year.

Similar savings, and an increase of electric power, would go to Canada. In addition, Canadian ports along the Great Lakes would be opened to ocean-going ships.

COST OF PROJECT

How much will it cost to carry out the "St. Lawrence Seaway and Hydroelectric Power Project"?

According to estimates made by U. S. Army engineers, the total cost of the project would be $421,474,515. If Congress approves the project, the cost would be shared by the United States and Canada.

The United States' share of the cost would be $277,056,515. About one-third of this – $93,000,000 – would be paid by New York State. In return, New York State would be given the right to control the distribution of electric power throughout the 300-mile radius in the U. S.

Canada's share of the cost is estimated at $144,418,000. Canada's share is smaller than the United States' because Canada has already built some of the installations needed for the project. In 1932, Canada built a new Welland Canal between Lake Erie and Ontario, at a cost of $131,900,000.

The St. Lawrence Seaway has actually been a-building for generations.

In 1855, the first locks and canals on the U. S. side were built at St. Mary's River, connecting Lake Superior and Lake Huron. Shortly before that time, the Canadians had built locks on their side of the river. In 1887, Canada built the first Welland Canal, which allowed ships to navigate around Niagara Falls.

By 1906, Canada had finished dredging a deep channel from the Gulf of St. Lawrence up to Montreal – 1,000 miles inland. Since then, both the U. S. and Canada have added one link after another to this vast chain of waterways. Canals and channels have been constantly improved for the passage of large ships.

Today, the only large construction job that remains is to build canals and locks in the 48-mile bottleneck of the International Rapids. When this is done, and the St. Lawrence is dredged in a few more places, ocean liners will be able to sail from the ports along the Great Lakes to ports on the Atlantic, and to foreign seaports.

Why isn't this last link of the seaway completed, you may ask.

Because, for one thing, the International Rapids belongs equally to Canada and the United States. Before canals or anything else can be built in the International Rapids, both Canada and the United States must agree to such construction.

Canada, even before the war, was ready to do her part. In 1934, President Franklin D. Roosevelt and Canadian officials agreed on a plan for the seaway. But the United States Senate would not approve it.

In 1937 and in 1941, Congress again refused to approve the seaway.

Today, the seaway project is once more before Congress. Representative William A. Pittenger, of Minnesota, has introduced a bill asking Congress to give the "green light" to the proposed seaway. The bill is now being debated by Congress.

Those who favor the Seaway project include President Truman; Governor Thomas Dewey and Senator Robert F. Wagner of New York; the governors and senators of the Midwestern States; Senator George Aiken of Vermont; Detroit's Mayor Edward J Jeffries, and Secretary of Commerce Henry A. Wallace.

Here are the main arguments these men offer in support of the Seaways project:

ARGUMENTS FOR SEAWAY

1. It would bring the benefits of low-cost water transportation to 50,000,000 people of the Middle West – the grain growers of the Dakotas, the automobile makers of Michigan, the dairy farmers of Wisconsin.

2. It would make some Great Lakes ports as important as the seaports on the Atlantic and Pacific coasts.

At present, grain and automobiles must first be shipped by rail to the Atlantic seaports before they can be shipped overseas. If the Seaways project is completed, automobiles will be loaded on ocean freighters at Detroit, and grain will be loaded at other Great Lakes ports, for direct shipment to Europe or to the Eastern coastal states.

3. It would provide low-cost electric power to the large industrial areas in New England, New York State, and portions of Pennsylvania and New Jersey. This would result in enormous savings for the people in these areas.

4. It would provide construction jobs for 20,000 workers over a four-year period – the length of time needed to complete the Seaway.

5. It would allow Great Lakes shipyards to build ocean freighters, since these could be sailed into the Atlantic.

The Great Lakes shipyards are presently limited to building ore carriers and grain carriers, used only on the Great Lakes.

Who is opposed to the St. Lawrence Seaway project?

ARGUMENTS AGAINST SEAWAY

1. Electric light and power companies are opposed to the project. They say that our Government has no right to spend taxpayers' money on a project which will compete with private business.

2. The coal operators who own the mines, and the miners who work the mines, are also opposed to the Seaways project. Coal is widely used as a fuel to generate electric power. The coal operators and miners say that if more hydroelectric power is used, there will be less need for coal. They are afraid that mines will be shut down, and miners thrown out of work.

3. Railroads and trucking firms, as well as railroad labor unions, are opposed to the project. Both the railroads and the trucking firms pay tremendous taxes to the Government. Like the electric and power companies, they do not see why these taxes should be used for a project which will compete with their own business.

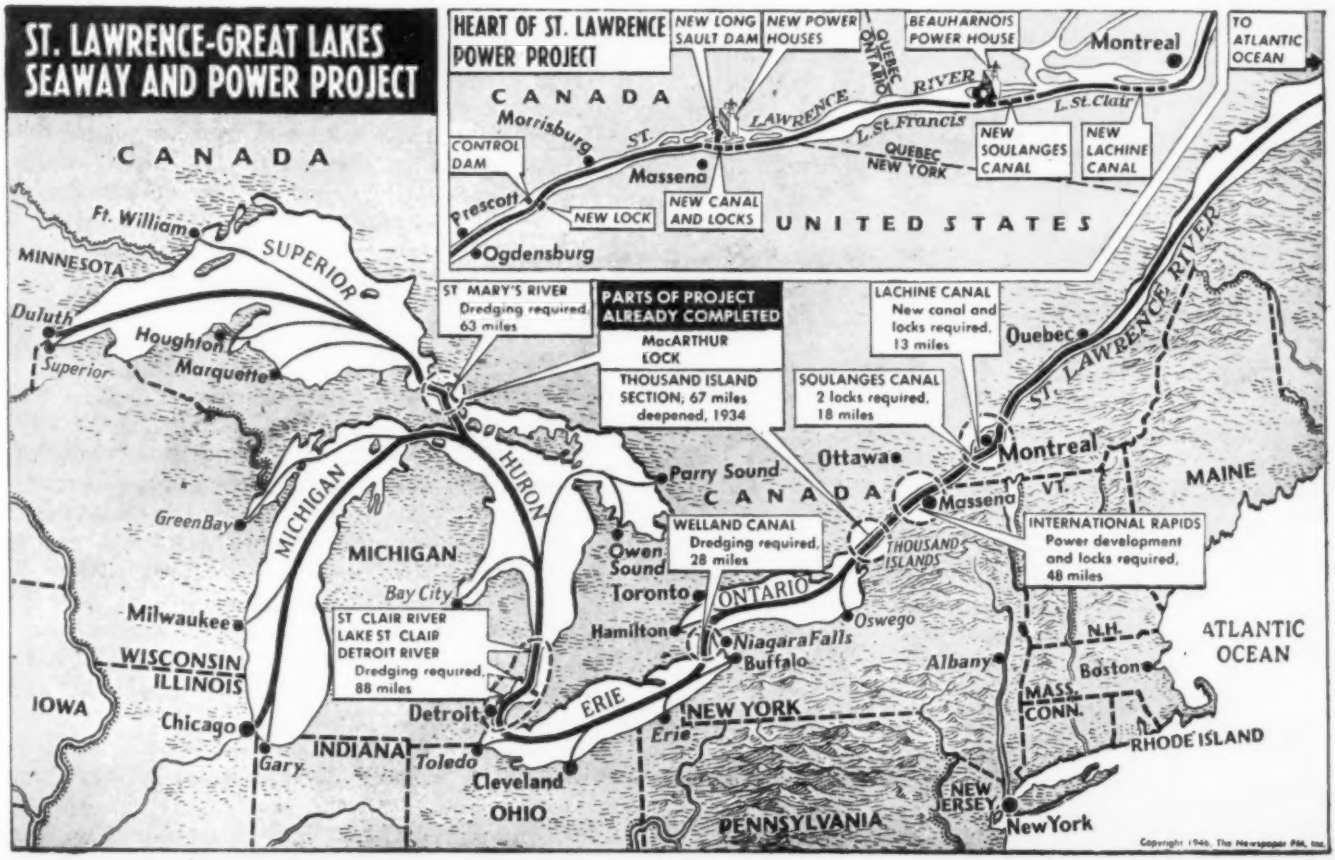
4. Also opposing the Seaway project are many business interests in such coastal ports as Boston, Baltimore, New Orleans, and New York City.

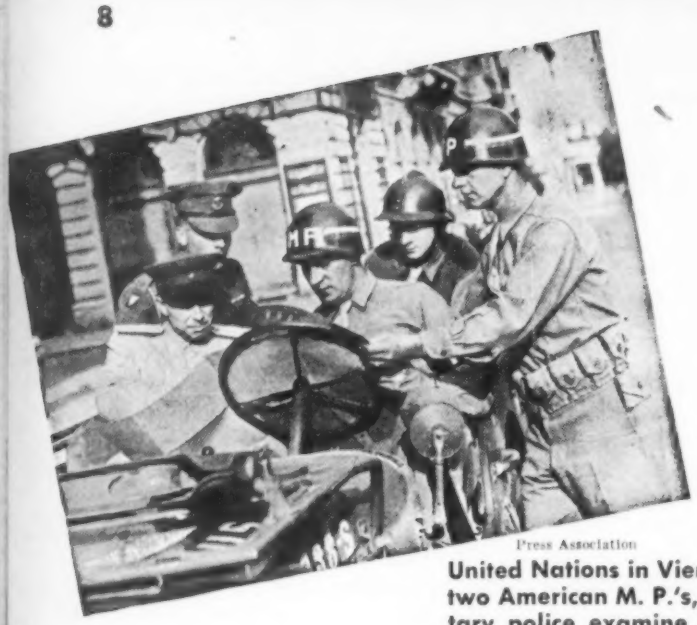
At present, these seaports handle most of the Midwest shipping to and from foreign countries. They are against any plan which would reduce the amount of shipping they handle and cut their profits. Also opposed to the project is the city of Buffalo, N. Y., on Lake Erie. Buffalo is now the transfer point where cargoes are unloaded from lake steamers and loaded into railroads, or vice versa.

CONGRESS TO DECIDE

Congress will have to decide whether the Seaway project will benefit not only certain sections of the country, but the country as a whole.

One fact they will have to consider is that each year the Seaway will be closed by ice from about December 15 to April 1. Thus the Seaway will be open to shipping for only about 8½ months out of each year.





Press Association

United Nations in Vienna: A Russian police officer, two American M. P.'s, and British and French military police examine a map of Austrian capital.

AUSTRIA

OCCUPIED by THE "BIG 4"

VIENNA, capital of Austria, was once a city where people relaxed in sidewalk cafes – sipping coffee or hot chocolate, and listening to gay Strauss waltzes.

Today, Vienna is no longer a gay city. The Viennese are drinking ersatz coffee* – when they are able to buy any in the black market. And they are concerned with the problem of keeping alive, rather than with Viennese waltzes.

Many of the buildings and streets of Vienna lie in ruins, smashed by Allied bombers. Food is scarce. So is clothing. And the shortage of fuel caused widespread suffering among the Viennese during the winter.

Through Vienna, as through all Austria, march the men of four Allied armies – American, Russian, British, and French.

OCCUPIED BY "BIG 4"

Austria is occupied by the "Big 4" Allies because she fought on the side of Germany during World War II. Many Austrians did not want to fight for Hitler. But their country was gobbled up by Germany in 1938, and they were forced to act as the Nazis ordered.

However, many Austrians believed in Hitler's Nazi propaganda and were glad to see Austria become a part of Germany. They believed that, as part of Germany, Austria would be better off. They felt that Austria was too small to survive alone.

Austria was not always a tiny country. Before 1918, it was top partner in the Austro-Hungarian Empire. (See last week's Theme Article on Hungary).

Austria-Hungary had an area of about 261,000 square miles, and a population of more than 51,000,000. It was a large, prosperous country. Vienna was one of the great capitals of the world. Viennese medical schools were world-famous.

In World War I, Austria-Hungary fought on the side of Germany. At the end of the war, the Allies split Austria and Hungary into two separate nations.

By the terms of the Treaty of Saint Germain, signed on September 10, 1919, a new Austria was formed of the German-speaking people of the old Austro-Hungarian Empire. The new Austria had a population of only about six million. The frontiers set by the Treaty of Saint Germain gave Austria an area of only 32,000 square miles.

Thus Austria shrank from a large, powerful nation to a tiny facsimile* of a country.

BETWEEN TWO WARS

Austria was proclaimed a republic on November 12, 1918. The men who formed the Austrian republic wanted their country to merge with Germany. Germany was also a republic after World War I. And the people of Austria speak the German language.

But German annexation (in German it is called *Anschluss*) of Austria was forbidden by the Allies. Instead, the Allies promised to protect Austria's independence, and to help her with loans of money.

Austria needed all the money she could borrow. For the next twenty years, Austria bought more goods from other countries than she sold abroad. Austria kept borrowing money from other countries to pay her bills. Her debts grew.

The main trouble with Austria was that she had too much industry and not enough markets (countries that would buy her goods).

In normal times, about a third of all Austrian workers were engaged in industry. During the depression (1930-1938), industry all over the world slowed down. In 1933, as many as 485,000 Austrians were out of work.

But, Austria did not have enough agriculture to feed her people without importing food from abroad. About one-third of all Austrians are farmers. They grow rye, potatoes, sugar-beets, wheat, oats, and barley. But the food they produce is not enough to satisfy the country's needs.

Lack of sufficient agriculture was only one of the problems faced by the young Austrian republic. Even more serious was the hard feelings which were growing between the peasants who worked the farms and the city dwellers, especially the industrial workers in Vienna.

The industrial workers were Socialists. The peasants were more conservative in their politics.

The farmers and other Austrians opposed to socialism, including members of the Catholic Centrist Party, formed an army called the *Heimwehr*. Its leader was Prince Ernst Rüdiger von Starhemberg.

The Socialists organized an army of workers called the *Schutzbund*.

* Means word is defined on p. 16.

Press Association

Cooking in Vienna: An Austrian family prepares a meal over a home-made stove. They live in a dugout.

At this time Hitler had not yet come to power in Germany. But Mussolini was fascist dictator of Italy.

Mussolini saw that the *Heimwehr* might be useful to him by spreading fascism. Since Austria was Italy's northern neighbor, Mussolini preferred to have fascists in power than Socialists.

DOLFUSS BECOMES DICTATOR

In 1932, Engelbert Dolfuss became prime minister of Austria. A year later, Dolfuss made himself dictator.

Supported by the *Heimwehr*, Dolfuss tried to outlaw the Socialist Party. Civil war flared up, and blood flowed in the streets of Vienna. The Socialists were crushed. Thousands were jailed, and the *Schutzbund* was dissolved.

Dictator though he was, Dolfuss had no love for Hitler, who came to power in Germany in 1933. Dolfuss preferred to "play ball" with Mussolini. He hoped that Mussolini would help Austria stay out of Germany's clutches.

Hitler was well aware of what Dolfuss was trying to do. Hitler's German Nazis were busy in Austria, organizing an Austrian Nazi Party. On July 25, 1934, a group of Austrian Nazis forced their way into the Chancellory in Vienna and killed Dolfuss.

The next Austrian prime minister, Dr. Kurt von Schuschnigg, made a deal with Hitler in 1936. Schuschnigg agreed to free Nazi political prisoners in Austria, and to allow Austrian Nazis to become members of the Austrian government. In return, Hitler promised to respect the independence of Austria.

Of course, Hitler did not intend to keep his promise. In February 1938, he called Schuschnigg to Berchtesgaden, Germany. He told the Austrian prime minister that Germany would settle for nothing less than *Anschluss* – annexation of Austria.

When he returned to Austria, Schuschnigg ordered a plebiscite★ for March 15. But Hitler had no intention of letting the plebiscite take place. He knew that too many Austrians hated him and his Nazis, and would vote against *Anschluss*.

Hitler threatened to invade Austria unless Schuschnigg cancelled the plebiscite and resigned. This he did.

After Schuschnigg resigned, the Austrian Nazi leader, Arthur Seyss-Inquart, became prime minister. He immediately asked Hitler to send troops to Austria "to keep order."

On March 12, 1938, Hitler triumphantly followed his troops into Austria and proclaimed it a part of the German Reich. Austria was made a province of Germany with the name Ostmark. Hitler appointed Seyss-Inquart as its governor.

FUTURE OF AUSTRIA

When the Allied armies occupied Germany in 1945, Austria was separated from Germany and given her old (1937) frontiers. The Allied Control Commission – representing the U. S., Britain, France, and Russia – divided Austria into four zones of occupation (see map). Vienna is occupied by troops of all four armies.

The Allies feel that Austria should not be treated as sternly as Germany, because Austria was herself a victim of Hitler. The Allies decided that Austrian independence should be restored.

Last November, the Austrians voted in free and democratic elections. They choose a National Assembly in which the Catholic People's Party won 85 seats, the Socialists won 76, and the Communists 4.

Leopold Figl, head of the Catholic People's Party, became prime minister. The President of Austria is Dr. Karl Renner, a Socialist, who was prime minister in the Austrian government which followed World War I. He also headed the Provisional Government after Austria's defeat in World War II.

Both Renner and Figl are staunch believers in democracy, and Austria seems to be in good hands.

How long the Allies will continue to occupy Austria is not known. Like Germany, Austria will have to pay reparations★ for her part in World War II.

Many economists say that even a small country like Austria can be prosperous if it is run right, just as a small business can be prosperous. These economists point to Switzerland, a tiny nation which has reached a high level of democracy and prosperity.

Next week: Czechoslovakia.

Map copyright 1946 The New York Times

Map shows Allied zones of occupation in Austria. Each zone is controlled by one of the "Big 4" – United States, Russia, Great Britain, and France.

Culver

Photograph of the flight at Kitty Hawk, N. C., Dec. 17, 1903. Orville Wright at the controls; Wilbur on ground.

THE TRUE STORY OF THE FIRST AIRPLANE FLIGHT

By Merrill Denison

THERE are two ways in which the story of aviation can be told.

One way is to record the attempts that were made to fly with ornithopters, helicopters, and gliders. To salute in turn all the inventors whose efforts contributed to the final success – the Englishmen, Sir George Cayley and Francis Wenham; the Frenchman, Jean De Bris; the German, Otto Lilienthal; the Americans, John Montgomery and Octave Chanute.

None flew, but each helped to keep the dream alive. Told in this way, the story of mechanical flight is a story of centuries of disappointment.

The other way of telling the same tale is to skip the years of failure that lie between Leonardo da Vinci and the final success. To jump from Italy to a small Ohio town in the 1870s, and pick up the tale on an autumn evening – when Bishop Milton Wright was returning home from one of his church trips, carrying in his pocket a small toy for his younger sons, Wilbur and Orville.

We can imagine Bishop Wright as he lets himself in the front door – a tall, bearded man with a genial smile for the surprise in store for his boys. Once inside, he sees a light coming from the kitchen where Mrs. Wright is working. He tiptoes down the hallway. . . .

MRS. WRIGHT: Land sakes, Milton, how you scared me. I didn't expect you for another hour.

FATHER WRIGHT (*Chuckling*): No? Well, truth to tell, Susan, I wanted to hurry home. I bought something for the boys and . . .

MRS. WRIGHT (*Smiling affectionately*): What was it you wanted for yourself this time, Milton? Is it in this parcel?

FATHER WRIGHT (*With quick anxiety*): Oh, careful, dear! It's easily broken.

MRS. WRIGHT (*Sagely*): I understand. You want to have the fun of opening it yourself.

FATHER WRIGHT (*Shamelessly*): Of course I do. Here, let me show you. (*Unwrapping the paper.*) There it is! The most ingenious thing I ever saw in my life.

MRS. WRIGHT (*Doubtfully*): But what is it, Milton? A toy?

FATHER WRIGHT: Toy? Yes . . . but its proper name is a helicopter. See, you wind up this elastic . . . these blades on top revolve . . . and the thing actually lifts itself off the ground. Now . . . half a jiffy . . . Watch . . . (*There is a whirring sound and the small, bat-like object darts suddenly across the kitchen.*) There! Isn't that about the most interesting thing you ever saw?

MRS. WRIGHT: Well, for goodness sake, Milton! It flies! Now, who in the world ever thought that up?

FATHER WRIGHT: Well, if you must know, it was an Italian gentleman named Leonardo da Vinci who had the idea first.

MRS. WRIGHT: And you went and bought that for Orv and Wilbur to play with?

FATHER WRIGHT (*A little apologetically*): Oh, I know I shouldn't have, Susan. But they'll enjoy it. And who knows, it may teach 'em something, too. Where are the young rapscallions? (*He opens the back door and calls.*) Orv! Wilbur! I've got something for you!

Little imagination is needed to picture the excitement of the next few days. The glistening, wonderful toy that soars upward to the ceiling and then flutters gently back to earth absorbs the waking hours of the two Wright boys – Wilbur, aged eleven, and his younger brother Orville, just reached seven.

A FEW DAYS LATER

FATHER WRIGHT (*Looking at his wife and Orv and Wilbur*): Well . . . aren't we all very quiet tonight?

MRS. WRIGHT: Oh, Milton, the boys have worn out the helicopter.

WILBUR: The elastic broke, Father.

FATHER WRIGHT (*Solemnly*): So . . . it's smashed already, is it?

WILBUR: It wasn't our fault, Father.

MRS. WRIGHT: Don't be angry with them, Milton.

FATHER WRIGHT: I'm not angry with them, Susan. I'm only curious to know what they're going to do about it. Well, boys?

ORVILLE (*Bravely*): We can try and fix it, can't we, Will?

WILBUR (*More bravely*): Shucks, no. We'll make another. A bigger one, that'll fly further and better. All we need is some cork and bamboo and rubber. Come on, Orv – we'll start in right now . . .

GROUNDWORK FOR INVENTION

The tiny mechanical "bat," with wings that revolved so fast you couldn't see them, passed out of the picture. But the Wright boys went on tinkering, inventing, making and breaking, and making over again. Blessed with far-seeing parents, the youngsters' love for mechanical things received every encouragement.

More significant, perhaps, than any other invention of their boyhood was

the home-made wood lathe – suggested by Orville and constructed by both of the boys out of a collection of odds and ends. From the lathe, the sons of Bishop Wright gained a knowledge of mechanical principles and the habit of good craftsmanship.

During the summer of 1896, Orville had typhoid fever and was cared for by Wilbur, a trained nurse, and Katherine, their sister – then home on vacation from her teaching post at Oberlin College.

WILBUR: How's Orv, Katherine? About perished with this heat?

KATHERINE: No, he seems much better, Will. Go in and see him. (*Raising her voice.*) Oh, Orv, here's Will come back . . .

ORVILLE (*Cheerfully*): Well . . . come on in! Howdy, Will, what's the news? Any excitement at the shop?

WILBUR (*Seating himself at the head of the bed and picking up a palm-leaf fan*): No, things've been pretty quiet, Orv. No chance of doing much business in this weather. Why, along about noon time you could have fried an egg on the pavement outside the store.

ORVILLE: Guess I'm not so bad off in bed after all, Will. Anything interesting in the paper?

WILBUR: Nothing much. There's one item, though, that I felt sorry about. That German fellow, Otto Lilienthal, was killed yesterday trying to fly one of those gliders he's been experimenting with.

ORVILLE (*Gravely*): Hard luck! How did it happen?

WILBUR: Lost his balance or something. Seems he hadn't quite solved the problem of maintaining equilibrium.

ORVILLE: That's a real tragedy. You know, Will, Lilienthal made some mighty valuable experiments. He probably would have got someplace if he'd lived.

WILBUR (*Curiously*): What do you know about his experiments, Orv?

ORVILLE: Why, I've read about them, off and on. Along with those of Maxim and Professor Langley . . . Why?

WILBUR: Oh, it seems a little funny, that's all. I've been keeping up with all these flying experiments, too. Remember that helicopter father gave us when we were kids . . .

ORVILLE (*Laughing*): Remember it! I should say I do. Gosh, we had fun with that . . . while it lasted. But do you remember those kites we used to make and sell? We made some pretty darn good kites . . .

WILBUR: I know we did and I was just thinking about them. Say, Orv . . .

ORVILLE: What is it, Will?

WILBUR: What do you say we look into this flying business seriously? You know, you and I might get somewhere working together.

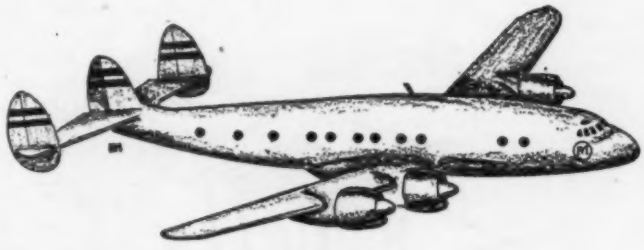
ORVILLE (*Thoughtfully*): We might at that, if we went at it the right way. First, we ought to get all the books that have been published on the subject I could read 'em while I'm getting well . . .

WILBUR (*With more excitement*): And when we find out all there is in books, we'll test out things for ourselves, step by step . . . Make models . . . go at it scientifically . . .

ORVILLE (*Rising on one elbow*): Yes, and not accept a darn thing until we prove to ourselves that it's right.

WILBUR: That's the only way, Orv. Build and experiment. Tear down, and build again, and go on building till we know we've cracked the nut . . .

The die was cast. The Wright brothers were pledged to a task that had defeated men all through the ages.



CONSTELLATION: Wing span, 123'; Length, 94', 11"; Height, 23', 8".

WRIGHT PLANE: Wing span, 40', 4"; Length, 19', 9"; Height, 8'.

Wrights' plane is dwarfed by today's *Constellation*.

A FIRST SUCCESS

The next step illustrates how quickly a keen, observant mind can profit by accident and chance. Toward ten o'clock on a July evening in 1899, Wilbur was at the bicycle shop which the brothers owned, when a late customer trundled in a bicycle and propped it against the open door. As he came into the shop:

WILBUR: You got here just in time. Another five minutes, and I'd have been on my way home. Got a puncture, eh?

CUSTOMER: Yep. And I figure it ain't worth fixing. Got a good inner tube?

WILBUR (*Taking a cardboard box down from the shelf*): This one's about as good as any.

CUSTOMER: Let's have a look at it. (*As the customer examines the tube, Wilbur begins to twist the empty box idly in his fingers. And, twisting, he glances down. Suddenly, his attention is riveted on what he is doing. After a careful examination of the tube, the customer puts his hand in his pocket.*) Guess this is all right, Will. How much is it? (*Wilbur pays no attention.*) Hey, Will! What's got into you? Are you deaf or something? What're you doing?

WILBUR (*Coming to a little*): Eh, what's that?

CUSTOMER: Gosh, you acted like you was in a trance! What're you so all-fired interested in that there box for?

WILBUR: This? Oh, it's just given me an idea. Did you want the tube?

The customer disposed of, Wilbur closed up the shop and raced home to wait for Orville, who had gone to a party with Katherine. At about midnight, the younger brother returned to find Wilbur seated in the living room – slowly twisting a small cardboard box, first one way and then another, between his hands.

Orville immediately saw what Wilbur was driving at. If wings could not be hinged, they could be twisted! Four cords attached to the four corners, and wings could be warped in any direction!

The problem of lateral balance was solved at last. A basic principle, essential to all airplanes, has been established through the unconscious manipulation of a cardboard box. The brothers plan to build a glider.

KITTY HAWK

Will the glider fly? Impatiently, the brothers speed up their work. At last, the glider needs but one thing to complete it – the front horizontal rudder. They stand looking at the glider, resting on the sand outside the work tent at Kitty Hawk, N. C. – the place recommended to them by the U. S. Weather Bureau.

ORVILLE (*Impulsively*): Let's try it!

WILBUR: Without the front rudder?

ORVILLE: Sure, why not? If it's going to work at all, it'll work without it. What we're interested in is lateral balance – and that front rudder won't affect the balance one way or the other.

WILBUR: You're right, Orv!

ORVILLE (*Impetuously*): Come on, then! Grab hold of that other wing!

WILBUR (*More deliberate, as usual*): Wait, wait. Hold your horses half a jiffy. We'll need a tow-rope.

ORVILLE: There's a coil of rope right inside the tent flap. I'll get it.

WILBUR: That's the ticket, Orv. Give me some of that rope.

ORVILLE (*Tossing Will a coil*): Where'll we tie it? Front outside struts?

WILBUR: That should do. 'Bout a third of the way up, I'd say.

ORVILLE (*Deftly slipping a half-hitch around his strut*): Ready, Will?

WILBUR: All ready, Orv! Swing your wing back a couple of feet, so we'll face the wind head on. (*Orv quickly obeys.*) That's got it! Now, for the big moment. Will it carry one of us? Like to shake on it, Orv?

ORVILLE: Let's take it as shook. I want to see if the darn thing works.

WILBUR: Come on, then! Straight down the slope! Run, Orv, run!

ORVILLE: Come on, Will! Faster! (*The brothers race down the dune. Very shortly, something begins to happen. Orv is the first to notice. With a joyous shout.*) She's rising, Will! Look at her!

WILBUR (*Casting all reserve aside for once*): Rising nothing, Orv! She's flying, boy! She's flying!

Straining at the ropes, the large glider took to the air and soared upward—thrilling its happy builders by the steady pull it exerted on their outstretched arms.

But in a few minutes, they had it on the ground. Would it still fly with one of them aboard? Stretching himself flat between the center struts, Will gave Orv the signal. Almost before he knew it, Will was in the air. The glider behaved as well with its first passenger, as it had without.

Although the total time the glider was in the air was little more than two minutes, the brothers felt well satisfied with their work. Their theories had been proved correct. Handled like a kite, the glider would carry a person. Its elevator rudder worked, and the warping principle maintained lateral balance.

Abandoning the glider to the mercies of the Carolina sand dunes, the two men returned to Dayton. The following July (1901) saw them back at Kitty Hawk again, with a larger glider.

The new glider had been designed according to the air pressures set forth in the tables compiled by Lilienthal and Chanute. These tables were later found to be unreliable. The two brothers wrongly concluded that they, and not the tables, were in error.

Disappointed, the brothers returned to Dayton in mid-August, almost determined to give up. But with their passionate zeal for nailing down facts, they again started from scratch – this time to find out what air pressures actually were under different conditions.

Again, trifling chance played its part. Lying awake in a mosquito-ridden tent one night, Orville had one of his penetrating flashes of genius. Why not hinge the stubborn, unpredictable rudder? Why not make it movable?

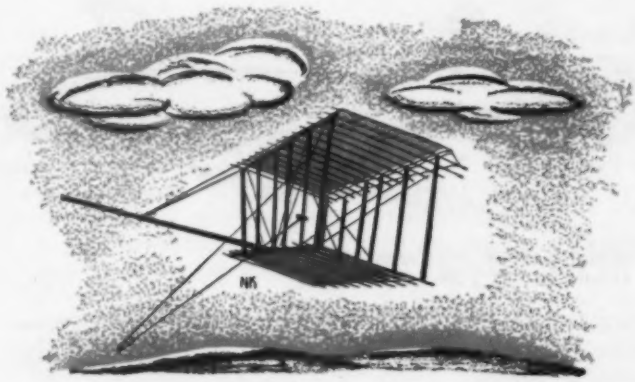
Although no one knew it, least of all the world at large, all the essentials of airplane design were now satisfied. The facts wrested from the wind tunnel, the warping wings, and the movable rudder had solved the problem of human flight.

One day in February, 1903, many residents of Dayton heard a series of explosions coming from the vicinity of the Wright Cycle Company's shop.

The bewildering noise was made by the brothers' home-made, four-cylinder airplane motor, in its first bench test.

THE FIRST FLIGHT

December 17 dawned cold and wintry at Kitty Hawk.



The Wrights' first glider was flown like a kite.

Breakfast over, Wilbur checks the velocity of the wind. He finds that it is blowing over 25 miles an hour. The Wright brothers have made many glider flights in winds stronger than this – but today's flight is going to be different.

"What do you think, Will?" asks Orville.

"I think we'd better wait awhile," Wilbur replies. "This wind may die down before long."

Shortly after breakfast, four men are seen crossing the sands from the direction of the village. Three are from the Life Saving station, and the other is a lumber buyer from a nearby town. These four, and a young boy who turns up later, are all the audience for one of man's great scientific conquests.

At ten o'clock, the brothers and the handful of watchers are standing outside the low workshed . . .

ORVILLE: What do you think, Will? Doesn't look as if this wind's going to slacken any.

WILBUR: Nope. Doesn't look like it.

1ST MAN: From what I know of the weather here, I'd say that wind's more likely to freshen than anything.

2ND MAN: Yep. If you boys are going to try that flying dingus today, you might as well do it now.

WILBUR: Let's put her on the track, Orv. (*He turns to the others.*) A couple of you take the landing skis. The rest spread out along the wings.

(*Slowly, the two Wrights, their helpers, and the visitors walk the biplane out of the shed . . .*)

WILBUR: Easy now, boys. Let her come down gently. (*The biplane is lowered to its position on the monorail.*)

4TH MAN (*To another of the guests*): 'Spose they'll get this thing to actually fly?

3RD MAN: Gosh hang it, they deserve to. Been monkeying around with this invention of theirs for over six years now.

1ST MAN (*To Wilbur*): How're you feeling? Pretty confident?

WILBUR (*Modestly*): I think we've got it – but you can never tell. Lots of other men have got this far.

2ND MAN: But none of 'em ever flew?

WILBUR: Exactly. I've still got my fingers crossed.

ORVILLE: Let's start the engine, Will.

WILBUR: Good idea. I'll crank it. Is that holding rope all right?

(*The holding rope is tested, the benzine turned on, and the spark set. Wilbur gives a crank, and the 12 h.p. motor breaks into a thunderous roar, with flames shooting from its open exhaust.*)

ORVILLE (*Now in position on the biplane, lying prone behind the engine*): Let her go when I give the signal! And hang onto that right wing! Try and keep her level on the track!

(*The machine moves forward. Wilbur runs beside it, one hand on the wing tip, in the other hand a stop watch. The biplane has gone about forty feet when . . .*)

1ST MAN (*He can't believe his eyes*): Look! It's lifting!

2ND MAN (*Excitedly*): You're right, b'gosh! Orv's off the ground!

THE BOY: I'll never get anyone to believe me when I tell 'em!

WILBUR (*In a state of wild excitement*): Keep going, Orv! Keep going!!!

THE FIVE: By gosh, they've done it! He's flying! The darn thing's in the air!!

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SCIENCE and INVENTION

ATOMIC WORLD

8. They Smashed the Atom

By DAVID DIETZ, Author of "Atomic Energy in the Coming Era"

IN 1919, the great British physicist, Sir Ernest Rutherford, smashed the atom for the first time in history.

Rutherford's method was very simple. He filled a glass tube with nitrogen gas. At the center of the tube he placed a tiny amount of radium salts. At one end of the tube, there was a thin metal wall, and beyond this was a fluorescent screen.

Rutherford focussed a microscope on the fluorescent screen, and watched for the result.

He knew that the radium was giving off alpha particles. But the length of tube was such that these alpha particles could not reach the fluorescent screen.

Yet Rutherford saw sparks of light through his microscope – something was striking the screen. He realized then that some alpha particles must have scored direct hits on nitrogen nuclei, knocking protons out of them. It was these protons which were striking the screen.

The most important thing shown by this experiment was that the protons came out of the nitrogen with more energy than was found in the alpha particles which released the protons. Rutherford's experiment proved that the nucleus of the atom was a storehouse of energy. If only we knew how to tap it!

This experiment started a wave of atom smashing in laboratories throughout the world. But it seemed impossible to release large amounts of atomic energy.

The trouble was that the alpha particles of radium were not good enough atomic bullets. Physicists had to fire about a million alpha particles to score one hit on the nucleus of an atom.

They decided that they needed better atomic guns—weapons that would fire heavier streams of atom bullets with greater speed.

In 1929, physicists began to design and build giant atom-smashers to increase the speed of the atomic bullets.

At first, scientists worked out machines which created man-made lightning bolts. By 1933, scientists were able to create voltages of over 7,000,000 volts. Carried at tremendous speed by these high voltages, atomic bullets struck their targets with great force.

In 1932, a high-voltage atomic gun succeeded in splitting the atom. Two English scientists, Dr. J. D. Cockcroft and Dr. E. T. S. Walton used electric transformers and vacuum tubes to produce a voltage of 700,000 volts. With this voltage they speeded up their bullets, which were protons. They manufactured these by stripping hydrogen atoms of their electrons. Protons, you will remember, are hydrogen nuclei. For a target, they chose lithium atoms.

What actually happened was this: When the proton (hydrogen nucleus) struck the atom of lithium it united with it. Then the atom of lithium split into two atoms of helium. At the same time, there was a tremendous release of energy. Where did this energy come from?

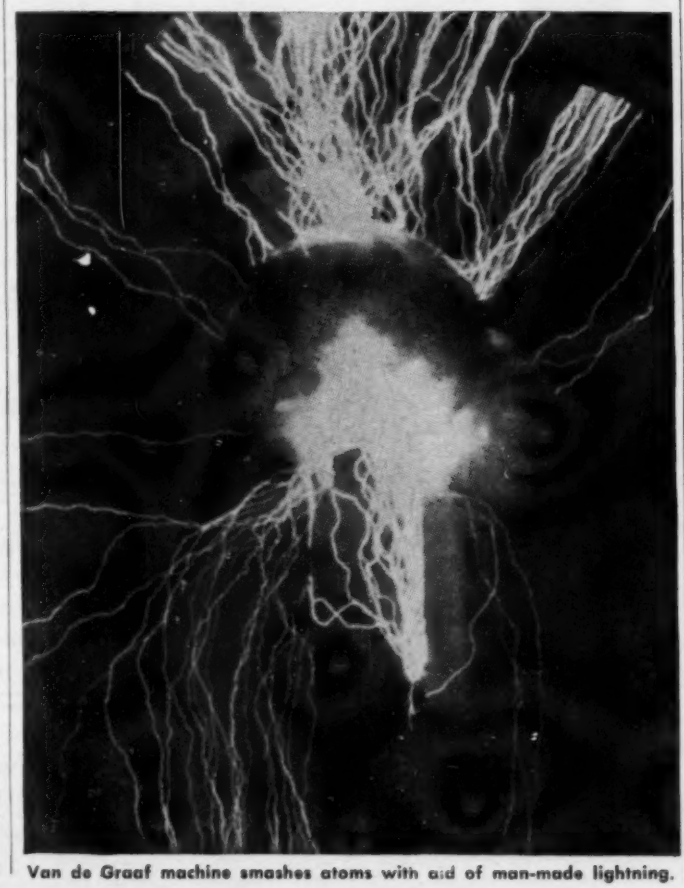
The two atoms of helium weighed less than the atom of lithium combined with a hydrogen nucleus. As physicists say, there was a loss in mass. The loss in mass was very small, as only a tiny particle of matter had been destroyed.

But the energy given off was exactly what Einstein had predicted twenty-seven years before. The small loss of mass caused a release of energy equal to 17,000,000 electron volts!

Here in the U. S., where scientists had built the heaviest atomic artillery, dozens of other atom smashing experiments were carried out. The result of all these experiments proved the Einstein equation correct.

Meanwhile, in the U. S. the greatest of all atomic "Big Berthas" had been built. It would soon be used to help isolate a strange new chemical substance – Uranium 235.

Next week: The Cyclotron



Van de Graaf machine smashes atoms with aid of man-made lightning.

Raincoat made of Koroseal

Test-Tube Fashions

THE clothing industry is making wide use of synthetic fabrics created by chemists.

These test-tube fabrics are made of by-products, many considered useless until modern chemistry turned them into "buy-products," made from such things as coal tar, crude oil, waste wood, cotton linters, milk, acid, glass, beans, and farm refuse. Out of such substances come fabrics like these:

Nylon: Used in wartime for balloon rigging, for parachutes, and for surgeon's thread to sew up wounds. In peacetime nylon is used to make women's hose, dresses, draperies, and many other things.

Fortisan: Fragile as a spider's web, fortisan is said to be the strongest textile in the world. It was used during the war in flare parachutes and barrage balloons. Today, fortisan becomes a filmy evening gown.

Koroseal: A waterproof fabric which the Army used for wire and cable insulation and Arctic face masks. It is now used for raincoats, upholstery, and other waterproof products.

Other famous test-tube fabrics you will be hearing about are: **Velon** – which cannot be stained by dust, mud, paint or ink; **Koda,** a fabric impregnated with fluorescent dye, which glows in the dark; and **Vinylite** – waterproof, crack-proof, and crease-proof.

BUILDERS OF AMERICA

WILLIAM KELLY (1811-1888)

Pioneer Steel-Maker

WITHOUT abundant cheap steel, the world could not have huge merchant ships, railroad networks, and air fleets. The process for quickly and cheaply converting pig iron into tough, elastic steel was stumbled on by William Kelly, a native of Pittsburgh, Pa., in 1850.

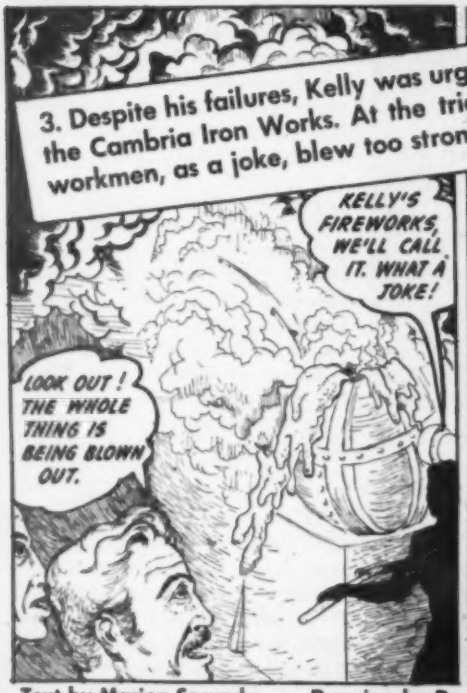
It was from an Englishman, Sir Henry Bessemer, who made the same discovery a few years later, that the world first learned of the "air-boiling" method. Bessemer was granted a United States patent in 1856. The next year Kelly proved that he made the discovery first and was declared the original inventor. But Bessemer's name was used to describe the process even in the United States.

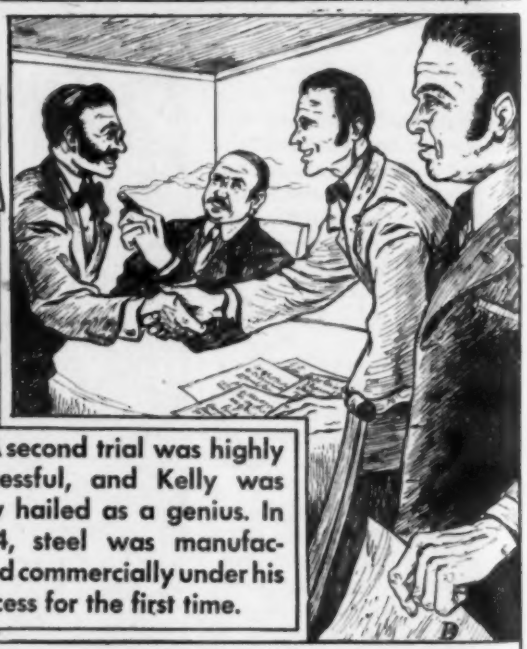
Bessemer reaped most of the fame and fortune, while Kelly's part in introducing modern steel-making was not recognized until recently.

1. Kelly, a kettle manufacturer, worried about the large amount of fuel he had to use in producing wrought iron. One day he noticed an amazing effect when an air blast hit the molten iron.

2. Although his friends ridiculed him, Kelly was convinced he could make steel "without fuel." From 1851 to 1856, he secretly built seven experimental converters in a secluded forest.

3. Despite his failures, Kelly was urged to work out his process in the Cambria Iron Works. At the trial of his new converter, the workmen, as a joke, blew too strong a blast into it.





4. A second trial was highly successful, and Kelly was now hailed as a genius. In 1864, steel was manufactured commercially under his process for the first time.

5. The next year, Kelly's company found its progress blocked by a firm using the Bessemer method. Rather than continue to violate each others' patent rights, the companies joined forces.

Text by Marion Secunda • Drawing by Don Burgess

SHEnanigans

"DISNEY-DOODLING" is an up-to-the-minute way of using your favorite comic characters to dress up old clothes. Here's how it works:

1. "Disney-Doodles" may be used to decorate almost any garment. Wear them on your coke jacket, raincoat, sweaters, school bag, skirt pockets, slacks, jackets, beanies, socks, and mitten tops. Or arrange several different comic figures to run up and down the sleeves of your swagger coats, or around the hem of your dirndl skirts.

2. Make a pattern by copying the comic characters you like. Disney characters are so popular you'll have no trouble finding pictures from which you can draw.

3. Use pattern to cut out various "parts" of your character from different colored scraps of material. Example: Donald Duck's body is one "part" which may be cut from white felt. His coat and cap can be blue. His bill and feet should be of yellow fabric. When cutting, allow ¼ inch all around to turn under. If *felt* is used, cut figures to size, since this needs no hemming.

4. Turn under edges of each part and baste down. Sew parts together. Embroider the eyes, buttons, etc. Remove basting threads after figure is sewn to garment.

Suggestions: Figures may be drawn directly on garment (use carbon paper) and embroidered. On cotton, linens, and silks, they may also be drawn on with colored wax crayons. When finished, place a piece of paper over design and press with hot iron. This will "set" colors so they can be washed.

If desired, ready-made patterns may be purchased for a small sum from the Simplicity Pattern Company, 200 Madison Avenue, New York 16, N. Y.

— MARY COOPER

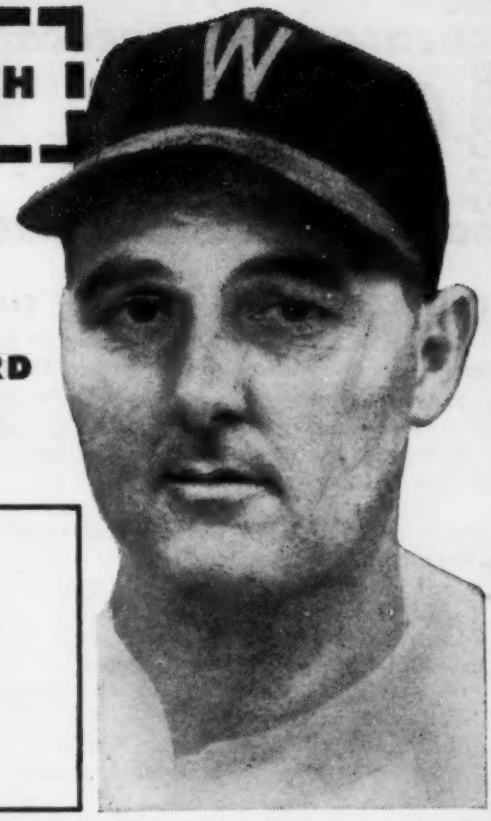
HOW TO PITCH

THE KNUCKLE BALL

by

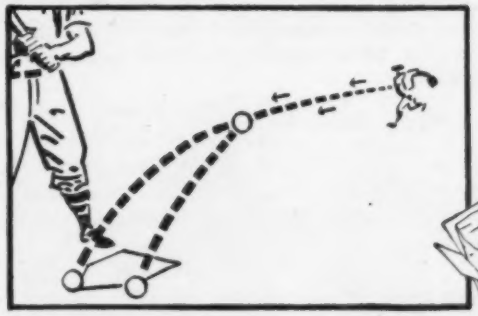
"DUTCH" LEONARD

Famous Knuckle Ball Pitcher of the Washington Senators



● **There are several ways to hold the knuckle ball. The easiest one to control is held with the tips of the index and middle fingers. The ball is held loosely with little pressure by the thumb or third and fourth fingers.**

● **In releasing the ball the fingers and wrist should remain stiff. Because no spin is applied, the ball barely revolves *and "floats" toward the batter.* The same effort is put into the pitch as when a fast ball is delivered.**



● **Not even the pitcher knows how the knuckle ball will break. Dirt taken up by the seams may cause greater resistance on the left side of the ball for one pitch and on the right side of the ball for another pitch. *The knuckler is a "freak" pitch and should not be used without the advice of your coach.***

● "If you're going to be a pitcher you may as well know it's no easy business," says "Dutch" Leonard. "It takes about all you've got to work a full game. So on the days it's my turn on the rubber, I often have an extra helping of Wheaties at breakfast time. Those whole wheat flakes hand out good nourishment to help get your breakfast off to a fast start. Yes, I'd say Wheaties are important eating for any ball player—and I'm including you right along with the big league stars."

"Breakfast of Champions"

WITH MILK AND FRUIT

●

"Wheaties" and "Breakfast of Champions" are registered trade marks of **General Mills, Inc.**

Complete pitching instruction **in "Want to be a Baseball Champion?" by baseball professor Lew Fonseca. Includes special pitching tips by champions Bob Feller, Bucky Walters. The back of your Wheaties package tells you how to get your copy of this authentic 32-page baseball manual.**

Citizenship Quiz

These questions are based on articles in this issue. Perfect score is 100. Answers are in TEACHERS EDITION.

1. QUIZ IN THREE-QUARTER TIME

Answer each of the following questions by underlining the correct answer. Score 5 points each. Total, 40.

1. What country annexed Austria in 1938?
   (a) Germany; (b) Switzerland; (c) Italy.
2. What is the common language spoken by the people of Austria?
   (a) Latin; (b) Austrian; (c) German.
3. What treaty, after World War I, deprived Austria of a large part of her territory?
   (a) Treaty of Versailles; (b) Treaty of Saint Germain; (c) Treaty of Paris.
4. To what political party did most of the Austrian peasants belong before World War II?
   (a) Catholic Centrist Party; (b) Socialist Party; (c) Republican Party.
5. What does the German word *Anschluss* mean?
   (a) Annexation; (b) Alpine Avalanche; (c) Workers Army.
6. What Austrian dictator was killed by the Nazis in 1934?
   (a) Johann Strauss; (b) Engelbert Dolfuss; (c) Kurt von Schuschnigg.
7. What four nations occupy Austria today?
   (a) Germany, France, Switzerland, Italy; (b) Russia, Britain, U S., France; (c) Spain, Germany, Russia, U. S.
8. What party has the majority of seats in Austria's National Assembly?
   (a) Communist Party; (b) Nazi Party; (c) Catholic People's Party.

My score _____

2. TWO IN A MATCH

Match the men in the column at left with their descriptions in column at right. Score 2 points each. Total, 10.

___ a. Karl Renner	1. U. S. Secretary of Commerce
___ b. William Kelly	2. President of Austria
___ c. Ernest Rutherford	3. Candidate for Presidency of the Philippines
___ d. Henry A. Wallace	4. American who invented a new way for making steel
___ e. Manuel Roxas	5. British scientist

My score _____

3. FILL IN

In the blanks provided, write in the word, or words, which correctly complete each of the following statements. Score 4 points each. Total, 20.

1. The U. S. took the Philippine islands from _____.
2. The proposed seaway between the U. S. and Canada is named _____.
3. _____ was the first scientist to smash the atom.
4. The name "Bessemer" is applied to a process for making _____.
5. The nation lying directly north of the U. S. is _____.

My score _____

4. PICTURES TO GUIDE YOU

Write the answers to each of the following questions in the blanks provided. Score 5 points each. Total, 30.

1. Where did the Wright brothers fly this plane?

_____

2. River linking the Atlantic Ocean with the Great Lakes.

_____

3. Name the five Great Lakes.

_____

4. President of the Philippine Commonwealth.

_____

5. In which of these cities is our largest airport being built?

_____

6. What is the capital of this nation?

_____

My score _____

My total CQ score _____

STARRED WORDS

Words starred ★ in the magazine are defined below.

exploit (ecks-PLOIT), p. 3. Make unfair use of; use selfishly for one's own advantage. Nations have often exploited their colonies by draining them of their wealth, by paying the natives poor wages, etc.

facsimile (fack-SIMM-ih-le), p. 8. An exact copy or likeness.

plebiscite (PLEBB-ih-site), p. 9. A direct vote by the qualified voters of a state. When a government wishes to learn what stand the people have taken on a certain issue, it asks the people to vote on it directly.

reparations (repp-uh-RAY-shuns), p. 9. Compensation for a wrong, or injury, paid by the one who is responsible for the wrong.

ersatz coffee (air-ZAHTS), p. 8. Ersatz means substitute. Ersatz coffee is not made from the coffee bean, but from any roasted vegetable – such as chicory, barley, acorns, turnips, wheat.

Think Before You Talk

WHEN you talk about other people, do you say the first thing that pops into your mind? That's easy — and careless.

Or do you take time to think clearly, and say what you mean? That's not easy — but it's careful and fair.

Donna sits next to you in class. She's the babbling brook type, and her gabbing annoys you. So, the next time someone mentions Donna's name, you say unthinkingly, "Oh, don't pay any attention to her! She's as nutty as they come!"

Of course, you don't mean any harm. You aren't talking seriously. But you *are* talking carelessly. Someone else will repeat what you said, and the ball will start rolling.

The only time to *stop* careless talk is before it *starts*. When you talk about other people, be careful. Be fair.

The Editors

How're you doing?

Two older people are talking. You have an important message for one of them. Should you:

A. Walk up to them, pause for a moment, and say, "Excuse me for interrupting, Mr. Smith, but I have a message for you?"

B. Wait in the background until they have finished talking, then approach Mr. Smith with the message?

C. Walk up behind Mr. Smith, tap him on the shoulder, and give him the message when he turns?

A is correct for an important or an urgent message. If message is not important or urgent, and you can spare the time, B would be appropriate.

SPORTS

King of the Milers

"LES MacMITCHELL is at it again!" That's No. 1 on the hit parade in the track world. After a three-year stretch in the Navy, Les is back winning every mile race in sight.

Les was born in New York City, and has lived there all his life. At the age of seven, a severe case of diphtheria laid him up for four months. The doctor feared he would never walk again. But Les fooled 'em.

He started running at George Washington High School. After a season on the relay team, he blossomed out as a distance star. He set national records in the 1000-yard run and cross-country.

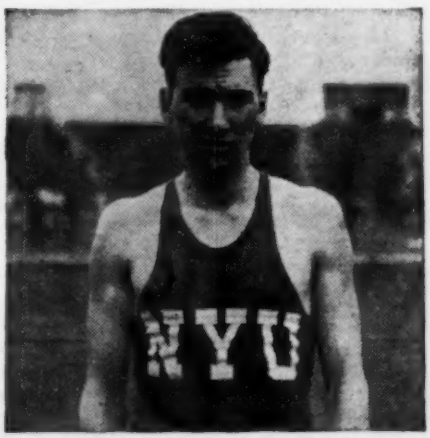
In the mile, the road to fame was rockier. He was defeated six straight times before he won a race. After graduating in 1938, he enrolled at New York University. In the next four years, he won more medals than a Hollywood star in a war picture.

Besides cleaning up in the mile, he went on to become one of the greatest cross-country runners (six miles) in our history. He ran in 40 of these races — and never lost one!

The mile king is 25 years old, stands 5 feet 11 inches, and weighs 158 pounds. Tall, dark and handsome, he is also strictly in the groove in the brains department. At N. Y. U., he had a 90% scholastic average.

His greatest thrill came on the last day of 1941 when he was awarded the James E. Sullivan Memorial Trophy as the outstanding amateur athlete of the year. That was the year he tied the world's indoor mile record of 4 minutes 7.4 seconds.

Our experts give him an even chance to win the Olympic title in 1948.



Les MacMitchell — King of Milers.

Junior Scholastic Word Wizard

Send your Word Trees to Junior Scholastic Word Wizards, 220 E. 42nd St., New York 17, N. Y. Include your name, address, school and name of teacher.

Good	Courage
Industrious	Ideals
Reliable	Truth
Loyal	Interest
	Zeal
Sociable	Endurance
Courteous	Necessity
Obedient	Success
Useful	Happiness
Truthful	Independence
	Purpose

ROBERTA PURNELL, Spence Jr. H. S., Dallas, Tex. — **GENEVA JENKINS**, Baker Village H. S., Columbus, Ga.

Happiness	Freedom
Order	Ability
Neatness	Inspiration
Energetic	Teamwork
Sincere	Honesty
Trustworthy	

ALFRED G. WOOD, New Albany (Pa.) School — **JOANNE STEVENS**, Edmond S. Meany School, Seattle, Wash.

Talent	Keenness
Earnestness	Interest
Ability	Neighborly
Manliness	Diligent
Wisdom	Neatness
Obedience	Equality
Responsibility	Sociable
Kindliness	Sincerity

DONALD DOANE, Ben Murch School, Washington, D. C. — **SALLY GARTMAN**, Highland Park (Mich.) H. S.

Solution to last week's News Word Puzzle

ACROSS: 1-Budapest; 8-Asa; 9-ever; 10-ten; 11-taro; 12-sup; 14-ft.; 15-boom; 18-Etna; 19-up; 21-egg; 23-teen; 26-yap; 28-area; 29-art; 30-Hungary's.

DOWN: 1-bat; 2-uses; 3-Danube; 4-pet; 5-Eva; 6-serf; 7-trot; 13-pot; 16-one; 17-Magyar; 19-Utah; 20-Peru; 22-Gary; 24-e'en; 25-nag; 27-pts.

WOW!! $10.00 WORTH OF FUN — ONLY 10¢!
500 foreign stamps, unsorted and unpicked, just as received from church missions, other sources. Africa, So. America, Australia, China, Philippines, Free French, and other countries. Includes few commemoratives, airmails, and stamps cataloging up to 25c or more each! Biggest value in stampdom—and you might find something really valuable! Price only 10c to serious approval applicants! Money back if not delighted.
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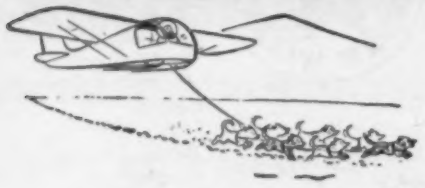
METAL GUNS—WITH HOLSTERS
SILVER RANGER GUNS—WESTERN COWBOY GUNS
Write for Circular
SHERIDAN COMPANY SOMERSWORTH NEW HAMPSHIRE

SOME FUN!



Flying

Cracker Jack

Tom and Jack were busily devouring a fruitcake sent by Jack's fiancee.

Suddenly, Jack started to groan. Then he doubled up, straightened out, and doubled up again.

"What's the matter?" Tom asked sympathetically.

"That cake," groaned Jack. "I think Mary forgot to shell the nuts in it."

"Gosh," said Tom. "Can you crack them just by bending?"

Lou Ellen Shaner, Black Lick School, Nanty-Glo, Pa.

Farm Fun

The farmer was showing his new assistant around the farm.

"Do you know anything about cows?" asked the farmer.

"Sure do," the assistant said proudly.

"Can you tell if that cow over by the fence is a Jersey cow?"

"Can't tell from here. Can't see her license."

George Flynn, Waterford (N. Y.) Public School

"another C.S. hit"
It's no secret that Louisville Slugger Bats account for practically all of Baseball's hits, for the greatest players of all time have made their records with these famous bats. To make every ounce of power count — you too can count on a LOUISVILLE SLUGGER!
Ready soon! The 1946 Famous Slugger Yearbook — full of interesting information and records on the past season. Ask your LOUISVILLE SLUGGER dealer or send 5c to Dept. S-32.
HILLERICH & BRADSBY CO., INC.
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YEAR BOOK
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Louisville
SLUGGER BATS
FOR BASEBALL & SOFTBALL

Rain or Shine

A very, very tough top sergeant told a private to water the lawn.

A half hour later, the sergeant found the private sitting idly in his barracks. "Why aren't you watering the lawn?" he bellowed.

"It's raining, sir," answered the private.

"Well," said the exasperated noncom, "you have a raincoat, haven't you?"

Jane Turk, Muse (Pa.) School

Keep It Floating

Joe: "What keeps the moon from falling?"

Flo: "Its beams."

Kenneth Hollander, P. S. 20, Rochester, N. Y.

Solid

The chemistry professor was demonstrating the properties of various acids.

"Watch carefully," he told the class. "I am going to drop this quarter into this glass full of acid. Will it dissolve?"

"No, sir," spoke up one pupil very promptly.

"Why not," asked the professor.

"Because if it dissolved," replied the pupil, "you wouldn't drop it in."

Bradley Smith, Brucker School, Kalamazoo, Mich.

Joke of the Week

Top humor honors and the Gold Star JSA button for this week go to Normal Hall, Albert Pike School, Fort Smith, Ark.

A young man, away from home on a new job, sent his folks a telegram:

"HAVE BEEN MADE FOREMAN — A FEATHER IN MY HAT."

Two months later, the family received another wire. It read:

"HAVE BEEN MADE MANAGER — ANOTHER FEATHER IN MY HAT."

A year later, came this mournful telegram:

"FIRED — SEND MONEY FOR RETURN HOME."

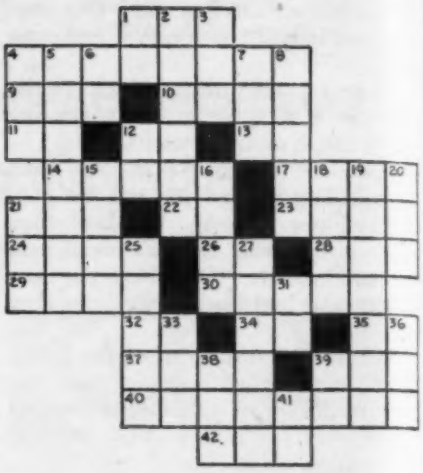
In answer, he received this wire from home:

"USE FEATHERS — FLY BACK."

OUR FRONT COVER

The flags on our front cover spell out the word *Junior* in the International Flag Code used by ships at sea. The *J* is represented by the top flag of blue and white horizontal stripes, the *U* by the flag with the red and white squares, the *N* by the flag which resembles a blue-and-white checkerboard, etc. The cover was painted for *Junior Scholastic* by Naomi Kronengold.

news X word



ACROSS

1. Pole used in rowing.
4. Province in W. Central Austria.
9. Opposite of *in*.
10. Gelatin made from seaweed.
11. Objective case of *we*.
12. Abbrev. for *saint*.
13. Form of *mother*.
14. Alpine province in Austria.
17. Pueblo tribe of North American Indians.
21. In favor of.
22. Abbrev for *Rhode Island*.
23. A cipher.
24. Region in Hokkaido Island, Japan.
26. Military police.
28. Tear.
29. Boys. 30. Apart; reserved.
32. Morning.
34. Indefinite article meaning *one*.
35. On condition that. 37. Sharp.
39. Frozen water.
40. To be present at (past tense).
42. Total up.

DOWN

1. Abbrev. for *ounce*.
2. One who abates, or reduces.
3. Covering for floor.
4. French coin.
5. Republic in central Europe.
6. Abbrev. for *lieutenant*.
7. Male sheep.
8. City on Mura River, S. E. Austria.
12. Abbrev for *senior*. 15. Yonder.
16. Capital of Peru.
18. Prefix meaning *air*.
19. Mouthlike opening, as of pipe.
20. Dip or soak.
21. Good friend.
25. Largest city in Japan.
27. Smoothed with a plane. 31. Upon.
33. Past tense of *meet*.
36. Past tense of *feed*.
38. Seventh letter of the Greek alphabet.
39. I would.
41. Abbrev. for *North Dakota*.

Answer in Teachers Edition this issue; in Pupils Edition next issue.

"BOY! YOU REALLY MOVE IN KEDS"

SPEEDY? Keds certainly are! They're the athletic shoes champions wear for all kinds of sports. For fast starts and quick stops, Keds are sure-footed. And for all day wear—hiking with the gang, or just foolin' around, you'd hardly know you have on shoes. Like going barefoot—without stubbed toes, cuts and bruises. Keds Scientific Last gives you toe room, so feet can develop healthfully. All Keds are made with cool-breathing uppers and are washable with non-marking soles.

Genuine "U.S." KEDS are made only by United States Rubber Company
Look for the name

KEDS SHOCK-PROOF ARCH CUSHION
(in certain styles) absorbs jars and jolts—helps avoid over-strain and muscle fatigue. A feature famous for years.

KEDS SCIENTIFIC LAST
is designed to fit growing feet. Gives straight-line toe action. Barefoot freedom with protection.

HYGIENIC KEDS are kept clean and odorless—the right way. Plain soap and water.

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When Travel

IS A FAMILY AFFAIR!

First thought, safety—and there's no safer travel than train! Next, cost—and here no one need sacrifice modern comfort to save dollars. For in addition to its great fleet of all-Pullman and Pullman-and-coach trains, the Pennsylvania Railroad provides such famous *all-coach* trains as . . . *The Trail Blazer*, New York-Chicago . . . *The Jeffersonian*, New York-St. Louis . . . *Liberty Limited* (*second section*), Washington-Chicago . . . *The South Wind*, Chicago-Miami . . . *The East Wind*, Washington-Maine, in summer season. With reserved individual reclining seats, observation-lounge car, radio, popular-priced meals among many features. At your Pennsylvania Railroad ticket office you will find pleasant, experienced aid in helping you personally to plan delightful tours.

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The Streamliner # City of San Francisco

pacemaker for trains to come

A sleek golden yellow streamliner glides out of Chicago, and another out of San Francisco. In one day and two nights these famous Overland Route trains span two-thirds of the continent . . . over the Rockies . . . skimming across Great Salt Lake on the spectacular Lucin Causeway . . . through Reno and over the High Sierra. These are the finest, fastest trains between Chicago and San Francisco.

If you have ridden the Streamliner *City of San Francisco*, you remember the gliding speed, the spacious cars and luxurious sleeping rooms, the superb food and service. It is like a fine hotel, on wheels.

On the *City of San Francisco*, the *Daylights*, the *Lark* and the *Sunbeams*, Southern Pacific tested many modern ideas in years of daily service. This experience gave us a head start in designing the trains to come.

tomorrow . . .

Southern Pacific is planning more streamliners. We will have them on our four major routes as fast as conditions permit. Already we have announced the SHASTA DAYLIGHTS, *two magnificent new streamliners that will provide daily daylight service between San Francisco and Portland on our spectacular Shasta Route.*

S·P ***The friendly Southern Pacific***

10 famous stopovers on CANADA'S VACATION LINE

The Nova Scotian, Halifax, N.S.
Pictou Lodge, Pictou, N.S.
The Charlottetown, Charlottetown, P.E.I.
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Minaki Lodge, Minaki, Ont.
The Fort Garry, Winnipeg, Man.
The Bessborough, Saskatoon Sask.
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